

# Work Order ID 114859

March-17-14 8:27:13 AM

**\*114859\***

Page 1

Item ID: D407-667-105

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Fwd Crosstube

Start Date: 3/17/14 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 3/31/14 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: MLJ Date: 1403-17

Tooling:

Date:

Run Start **\*NR1\***

QC: Date:

SPC (Y/N):

Date:

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
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D407-667-145	Rev C (DEO)
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DSI9565	A
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DSI9628	A
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*\*SP*

100

Document Control

0.00

**\*100\***

DOCUMENT CONTROL

DC

Memo

0.00

Doc.Control -USB or Paperwork

Photocopy bluefile and create labels as per PPP D407-667-105 CHG005

MAY 08 2014

DAS  
06  
9-89

1

*MLJ*

110

**\*110\***

Packaging

0.00

Packaging

Memo

0.00

Packaging

*TW*

14-04-14



# Work Order ID 114859

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Item ID: D407-667-105

Revision ID:

Item Name: Fwd Crosstube

Start Date: 3/17/14 Start Qty: 1.00 **\*1\***

Required Date: 3/31/14 Req'd Qty: 1.00 **\*1\***

Reference:

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Stop **\*NS2\***

Cust Item ID:

Customer:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_

Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120	BENDING MACHINE - CROSSTUBES	0.00							
<b>*120*</b>		0.00							
CNC Bend 2	Memo								
CNC Alpha 160 Bender	Bend tube as per Dwg D407-667-145 using CNC bender program 407-fw								
130	QC15- Crosstube Dimensional Check	0.00							
<b>*130*</b>		0.00							
QC	Memo								
Quality Control									

DAS  
03  
9-89

JW 14.04-15

DP 14-4-15



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Item ID: D407-667-105

Revision ID:

Item Name: Fwd Crosstube

Start Date: 3/17/14

Start Qty: 1.00

\*1\*

Required Date: 3/31/14

Req'd Qty: 1.00

\*1\*

Reference:

Accept

\*N900040100\*

Setup Start

\*NS1\*

Stop

\*NS2\*

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

\*NR1\*

QC:

Date:

SPC (Y/N):

Date:

Stop

\*NR2\*

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

140

\*140\*

Crosstubes

Crosstubes

Crosstubes

Memo

0.00

\*\*\*\*\* ENSURE PROPER JIG POSITIONING BEFORE DRILLING\*\*\*\*\*  
VERIFIED BY: EB \*\*\*\*\*

1- Drill holes & ream using drill Jig DT8541 & DT8542 as per Dwg D407-667-145. Drill all (3) top holes. Holes facing inboard.

\*\*\*\*\* ENSURE PROPER JIG POSITIONING BEFORE DRILLING\*\*\*\*\*  
VERIFIED BY: EB \*\*\*\*\*

2- Drill Fwd rivet holes using drill Jig DT8787 fwd as per Dwg D407-667-145.  
Note: Fwd side has 3x top holes. Facing inboard.

3- C'sink holes as per Dwg D407-667-145. Allow rivet to sit below surface to compensate for paint.

4- Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. Drill ONLY 2 top holes ONLY plug most bottom holes to prevent accidental drilling.

\*\*\*\*\* ENSURE PROPER JIG POSITIONING BEFORE DRILLING\*\*\*\*\*  
VERIFIED BY: EB \*\*\*\*\*

5- Drill holes and ream using drill Jig DT8541 & DT8542 as per Dwg D407-667-145. Drill only the top (2) holes.

\*\*\*\*\* ENSURE PROPER JIG POSITIONING BEFORE DRILLING\*\*\*\*\*  
VERIFIED BY: EB \*\*\*\*\*

EB 14-04-16

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**\*N900040100\***

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Revision ID:

Item Name: Fwd Crosstube

Stop **\*NS2\***

Start Date: 3/17/14 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 3/31/14 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
	6- Drill Aft rivet holes using drill Jig DT8787 aft as per Dwg D407-667-145.								
	7- C'sink holes as per Dwg D407-667-145. Allow rivet to sit below surface to compensate for paint.								
	8- Scribe part # and batch # using vibrating stylus as per Dwg D407-667-145 Inside of Cuff (Do not engrave on outside of tube)								
	9- *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D407-667-145								
150	QC5- Inspect part completeness to step on W/O	0.00							
<b>*150*</b>									
QC	Memo	0.00							
Quality Control	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
160		0.00							
<b>*160*</b>									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	1-CLEAN CROSSTUBE WITH WASH'N WIPE								

DAS  
27  
9-89

M/4/22

BCL

14-04-16

14-04-16

CR 14-04-22

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Setup Start **\*NS1\***

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Item Name: Fwd Crosstube

Stop **\*NS2\***

Start Date: 3/17/14 Start Qty: 1.00 **\*1\***

Required Date: 3/31/14 Req'd Qty: 1.00 **\*1\***

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	Outsource process - NDT per QSI038 4.1	0.00							
<b>*180*</b>									
Outsource2	Memo	0.00							
Outsource process - NDT	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***  OUTSIDE SERVICE -CROSSTUBES Liquid Penetrant Inspection as per QSI 038 Or Issue P/O <u>23883</u> LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order								<u>C214/04/23</u> (1)
190		0.00							
<b>*190*</b>									
Packaging	Packaging								
Packaging	Memo	0.00							
Packaging	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Inspect for transit damage Ensure copy of NDT results attached to work order.								<u>Pack/23</u> (4)
200	QC5- Inspect part completeness to step on W/O	0.00							
<b>*200*</b>									
QC	Memo	0.00							
Quality Control	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***  Inspect for damage & ensure results are as per Dwg D206-667-145								<u>inf 14/4/29</u>

JAS

27

3-29

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**\*N900040100\***

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Start Date: 3/17/14 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 3/31/14 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
204		0.00							
<b>*204*</b>									
HandFXtube		0.00							
Hand Finishing Crosstubes	Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***  1- PRESSURE WASH AND THEN USE WASH'N WIPE TO CLEAN CROSSTUBE BEFORE CHEMICAL CONVERSION								
206		0.00							
<b>*206*</b>									
QC		0.00							
Quality Control	Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								

*JB / BK* 14-04-24

*AWA*

*And*

DAS  
16  
9-89  
14/04/29



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Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***  
Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	SprayPaint	0.00							
<b>*210*</b>									
SprayPaint	Memo	0.00							
Spray Painting	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	***MASK AREA RPIOR TO PAINTING AS PER DWG AND DEO***								
	1-Prime inside and outside crosstube as per QSI 005 4.2								
	2-Paint outside crosstube with White Imron as per QSI 005 4.2								
	PRIME BATCH: <u>124403</u>								
	Start Time: <u>8:00</u>								
	Finish Time: <u>8:30</u>								
	PAINT BATCH: <u>1128840</u>								
	Start Time: <u>12:30</u>								
	Finish Time: <u>1:00</u>								
220	QC14- Inspect Spray Paint	0.00							
<b>*220*</b>									
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								

DAS

27

19-09

4/4/28

CL 14-04-28

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Item ID: D407-667-105

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**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID:

Item Name: Fwd Crosstube

Stop

**\*NS2\***

Start Date: 3/17/14

Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 3/31/14

Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

**\*NR1\***

QC:

Date:

SPC (Y/N):

Date:

Stop

**\*NR2\***

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

230

Crosstubes

0.00

**\*230\***

Crosstubes

Memo

0.00

Crosstubes

INSTALL GROUNDING CLAMP AND SEAL WITH SIKAFLEX AS PER DWG AND DEO

A/R SIKAFLEX BATCH: 127918

exp 8/14

1-Abrade mating surfaces of support and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg

2-Install supports with Proseal 890 per D407-667-145 (DEO) and QSI 015

A/R Proseal 890 Batch: 128712

EXP: 10/14

3-Install supports clamps Using Dt9565 as per Dwg D407-667-145 (DEO), Torque to 80-100 IN-LBS.

PROSEAL CURE TIME 72 HOURS:

Start: 14-5-4

Finish: 14-5-7

4-Install nut plates as per Dwg D407-667-145. Touch-up rivet heads with Imron paint.

1 0 0 AD  
14-5-4

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**\*N900040100\***Setup Start **\*NS1\***

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Item Name: Fwd Crosstube

Stop **\*NS2\***Start Date: 3/17/14 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 3/31/14 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***  
Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240 <b>*240*</b> QC Quality Control	QC5- Inspect part completeness to step on W/O  Memo ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS AS PER DWG.***  ***VERIFY RESISTANCE AS PER NOTE 18 AND DWG DEO***	0.00  0.00	DAS 27 9-89 145h						
250 <b>*250*</b> Packaging Packaging	Pick Kit  Memo	0.00  0.00	DAS 26 9-89			1			DAS 37 9-89
260 <b>*260*</b> QC Quality Control	QC4- 100% Inspect kits for completeness  Memo	0.00  0.00	DAS 06 9-89			1			

MAY 08 2014

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Item ID: D407-667-105

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**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

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Stop **\*NS2\***Start Date: 3/17/14 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 3/31/14 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_Run Start **\*NR1\***  
Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
270	Packaging	0.00							
<b>*270*</b>									
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D407-667-105								
	Location: <u>099</u>								
	PPP Rev: _____								
280	QC21 - Final Inspection - Work Order Release	0.00							
<b>*280*</b>									
QC	Memo	0.00							
Quality Control									

MAY 08 2014

DAS  
06  
9-89DAS  
31  
9-89

MLJ 14-05-12

MF  
14-5-8

# Picklist Print

March-17-14 8:27:18 AM

Page 1

Work Order ID: 114859

**\*114859\***

Parent Item: D407-667-105

**\*D407-667-105\***

Parent Item Name: Fwd Crosstube

Start Date: 3/17/14

Required Date: 3/31/14

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:F 05.09.01Add holes for compatibility with Bell SkidtubesKJ/JLM  
 IPP Rev:G 08-05-16 chg QC6 to QC15 DD verified by:EC  
 IPP Rev:H 08-06-03 update as per DSI9415 (ECN1198) DD verified by:ec  
 IPP Rev:I 08-07-14 add (scribe inside of tube) seq.6 DD verified by:EC  
 IPP Rev:J 08-07-28 update as per (par 08-013) DD verified by:EC  
 IPP Rev K 09.01.06 ECN 08-562 EC verified by:DD IPP REV:L  
 11.08.05 PER ECN 11-615 DD VERF:EC IPP REV:M 12.08.20  
 DSI9628 revA (ECN12-631) DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D206-667-017		Manufactured	No				Each	19.0000		1			

**\*D206-667-017\***

Ground Strap Installation

\*\*

AL 14-5-5

~~DAS~~  
~~26~~  
~~9-89~~

Location	Loc Qty	Loc Code
FG	2	
102581	2	
LG050	17	
107968	5	
112920	10	
97504	2	

AN5-10A

Purchased

No

250

Each

424.0000

10

**\*AN5-10A\***

BOLT

\*\*

14-5-8

DAS  
06  
9-89

Location	Loc Qty	Loc Code
GA	101	
122800	101	
ST362	116	
M127432	116	
st503	207	
M126180	207	

M128634

DAS  
26  
9-89

~~DAS~~  
~~31~~  
~~9-89~~

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Start Date: 3/17/14

Required Date: 3/31/14

Start Qty: 1.00

Required Qty: 1.00

AN5-30A

Purchased

No

250

Each

302.0000

4

4

DAS  
26  
9-89

**\*AN5-30A\***

BOLT

DAS  
06  
9-89

Location

Loc Qty

Loc Code

ST337

47

124805

47

st503

255

M127363

150

M128403

105

m128561

DAS  
31  
9-89

AN5-32A

Purchased

No

250

Each

364.0000

4

4

DAS  
26  
9-89

**\*AN5-32A\***

Bolt

DAS  
06  
9-89

Location

Loc Qty

Loc Code

ST337

134

124215

130

m127363

4

st503

230

m127550

30

m128403

200

DAS  
31  
9-89

MS21042L5

Purchased

No

250

Each

816.0000

4

DAS  
26  
9-89

**\*MS21042L5\***

Nut

DAS  
06  
9-89

Location

Loc Qty

Loc Code

GA

5

117611

5

ST315

311

m127304

311

ST509

500

m127813

500

DAS  
31  
9-89

m128810

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Shop Packet Print

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# Picklist Print

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Start Date: 3/17/14

Required Date: 3/31/14

Start Qty: 1.00

Required Qty: 1.00

NAS1149D0563J

Purchased

No

250

Each

5,011.000

18

18

**\*NAS1149D0563.J\***

Washer

\*\*

14-5-8

DAS  
06  
9-89

## Location

## Loc Qty

## Loc Code

GA

273

m125807

273

ST510a

4738

m126319

2738

m128257

2000

D407-667-105TRN

Manufactured

No

110

Each

3.0000

1

**\*D407-667-105TRN\***

Crosstube Turning Detail

\*\*

1

JV 14.04.14

## Location

## Loc Qty

## Loc Code

LG

3

112784

1

112785

1

112787

1

D2873-043

Manufactured

No

230

Each

52.0000

2

2

**\*D2873-043\***

Nut Plate Assembly

\*\*

CR 14-04-26

## Location

## Loc Qty

## Loc Code

LG052

52

104871

1

107964

20

112264

31

14550

2

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\*114859\*

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Parent Item Name: Fwd Crosstube

Start Date: 3/17/14

Required Date: 3/31/14

Start Qty: 1.00

Required Qty: 1.00

D2873-045

Manufactured No

230

Each

57.0000

2

2

\*D2873-045\*

Nut Plate Assembly

\*\*

OK 14-04-26

Location

Loc Qty

Loc Code

LG

40

112430

40

2

LG052

17

108829

17

Manufactured No

230

Each

45.0000

2

2

D2891-1

\*D2891-1\*

Support 2.25

\*\*

AS 14-5-4

Location

Loc Qty

Loc Code

FG

2

84164

2

LG051

8

107581

8

LG052

35

112254

16

113044

19

Manufactured No

230

Each

100.0000

4

4

D3595-063-395

\*D3595-063-395\*

Rubber Cushion

\*\*

AS 14-5-4

Location

Loc Qty

Loc Code

FG

5

87353

5

LG

90

110958

50

112363

40

LG051

5

109481

5

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**\*114859\***

**\*D407-667-105\***

Start Date: 3/17/14

Required Date: 3/31/14

Start Qty: 1.00

Required Qty: 1.00

MS21920-20

Purchased

No

Each

118.0000

4

**\*MS21920-20\***

Clamp

\*\*

AL 14-5-4

Location

Loc Qty

Loc Code

FG

2

122254

2

LG050

116

m126266

1

m127225

40

m128429

75

MS20601-AD4W10

Purchased

No

230

Each

158.0000

14

14

**\*MS20601-AD4W10\***

RIVET

\*\*

CR 14-04-26

Location

Loc Qty

Loc Code

LG050

158

M127301

58

M127578

100

m128 718

14

March-17-14 8:27:18 AM

Shop Packet Print

Page 5

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

Work Order: _____  Part No. _____  NCR No. _____	<b>DISPOSITION</b>  Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	<b>AGAINST DEPARTMENT/PROCESS</b>  <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

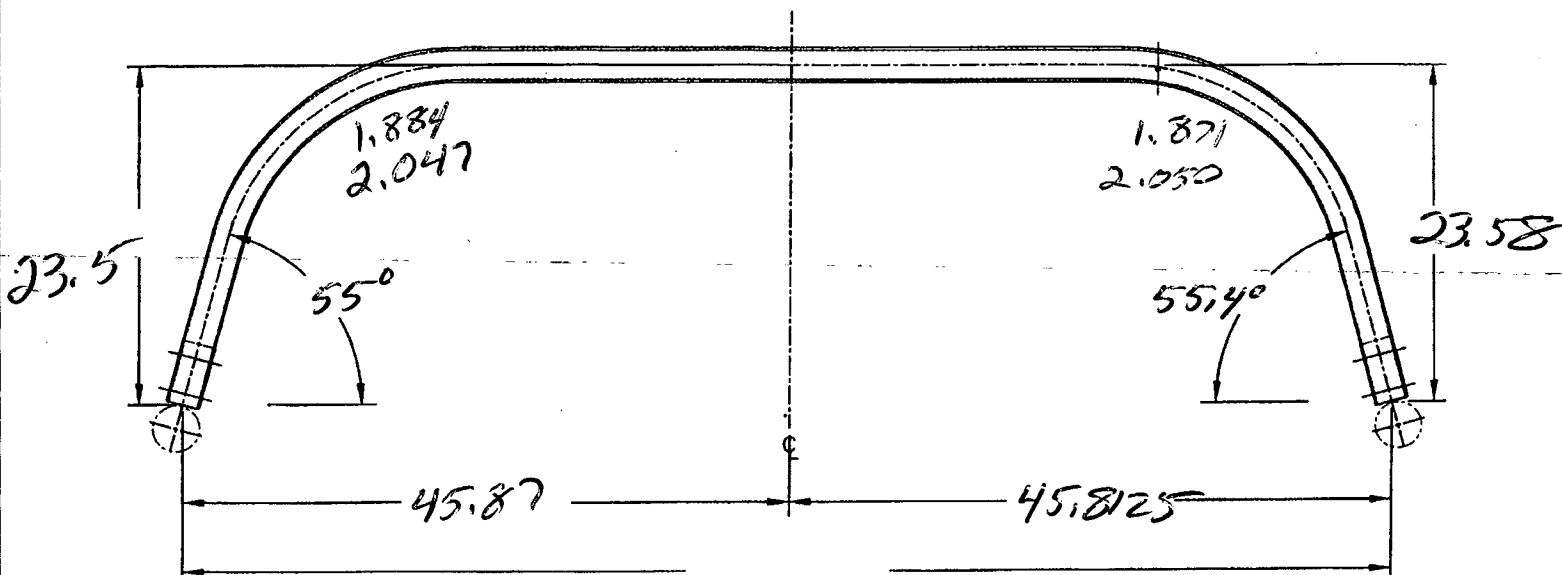
### FAULT CATEGORY

<b>Landing Gear</b> <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Crimp/Kink/Ripple/Wave <input type="checkbox"/> Cuffs <input type="checkbox"/> Crushing <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Marks/Chatter <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence  <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge  <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
--	--	---



<b>DART AEROSPACE LTD</b>	<b>Work Order:</b>	114859
<b>Description:</b> Crosstube High Fwd (407)	<b>Part Number:</b>	D407-667-105
<b>Inspection Dwg:</b> D407-667-145 <b>Rev:</b> C		<b>Page 1 of 1</b>

Required Dimension	Min	Max
Height	23.41	23.67
1/2 Span	45.81	46.07
Angle	54	56
Total Span	91.62	92.14
Bending Passes	6	--
Crushing	--	6%



	Side A	Side B
Bending Passes	13	15
Crushing	4.1%	4.6%
Comments		

QC15 Inspection	DAB
Date	03 9-89
	14-4-15

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.11.12	Dimensions updated per Dwg Rev C	KJ	
C	12.04.16	Added bending, crushing dimensions	KJ	
D	12.10.30	Revised Total Span dimensions & Dwg Rev	KJ	42

Item	Qty -145	Part Number	Description
1	X	D407-667-145	CROSSTUBE ASSEMBLY (407 HIGH FWD)
2	1	D6010-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
7	4	MS21920-20	CLAMP (OR MS21920-21)
8	14	MS20601AD4W10	RIVET (OR NAS9302B-4-10)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

# **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6010-115  
FINISHED LENGTH = 113.20 ± 0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-145" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 17.8 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN.-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

114859 MJS 140317

DEO ATTACHED

ECW #11-615

H.07.26

UNDER REVIEW

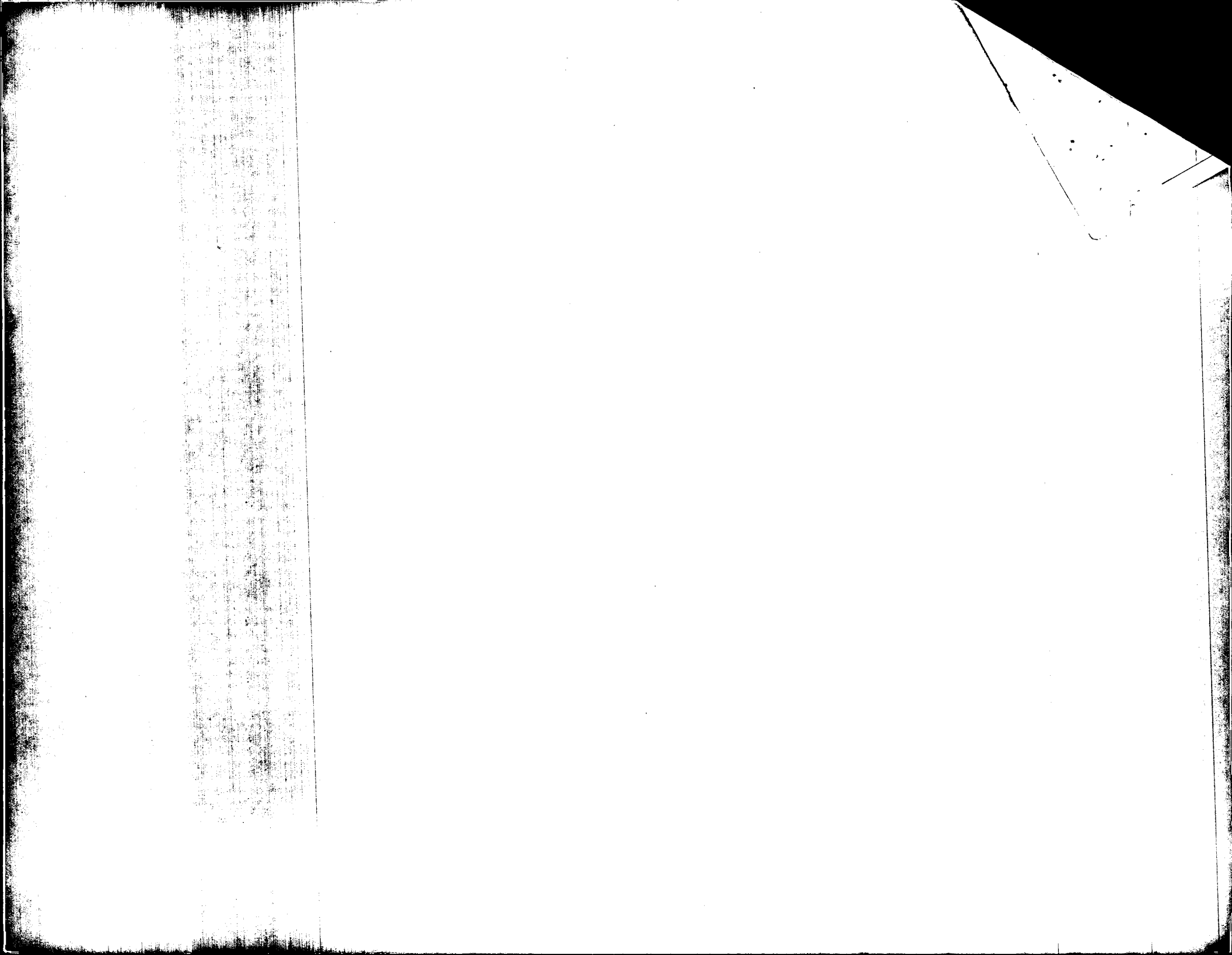
RELEASED  
08/11/12

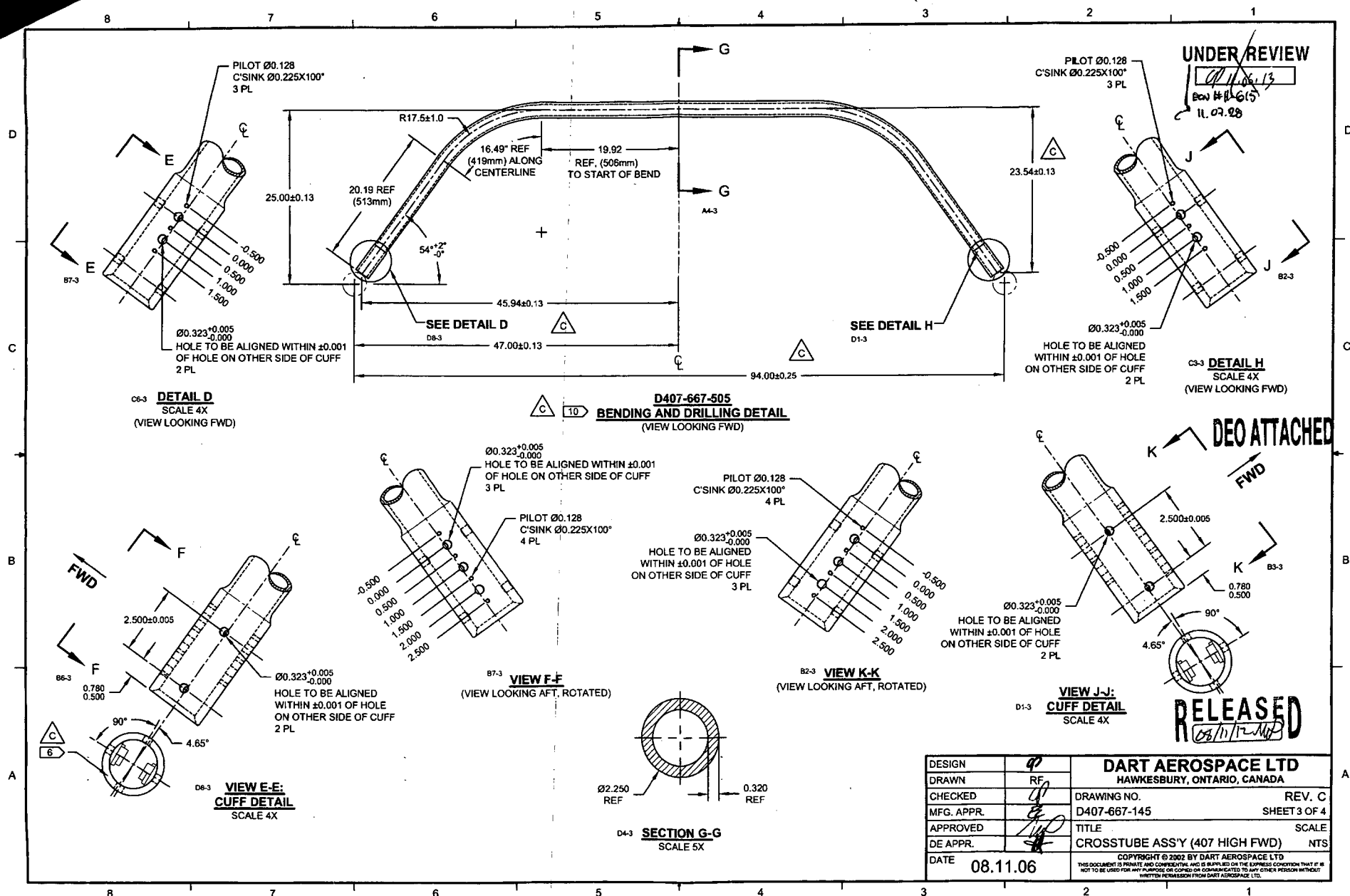
C	REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3595-063-395 WAS D2858-400-694 (ZN D6-2 & A5-2); REMOVED REF. 7 ADD TOLERANCES (ZN C6-3, C4-3, D2-3); RELOCATED FLAG #6 (ZN A8-3) PER NCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
B	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKUDTUBES	PH	05.07.26
A	NEW ISSUE	CP	02.05.08
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	DRAWING NO.	REV. C
CHECKED	RF	D407-667-145	SHEET 1 OF 4
MFG. APPR.	RF	TITLE	SCALE
APPROVED	RF	CROSSTUBE ASS'Y (407 HIGH FWD)	NTS
DE APPR.	RF	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DATE	08.11.06		











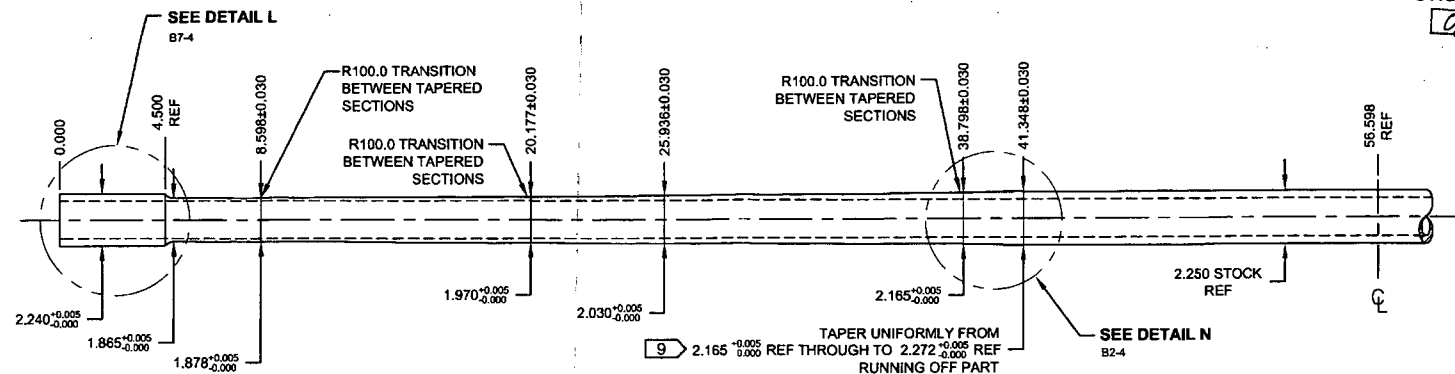


UNDER REVIEW

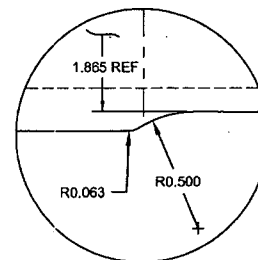
08/11/06

603 H (11.615)

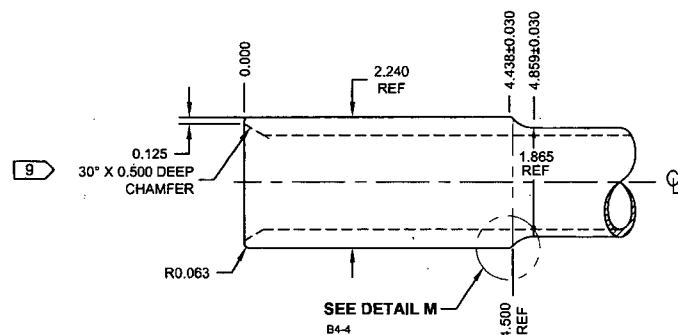
1.09.26



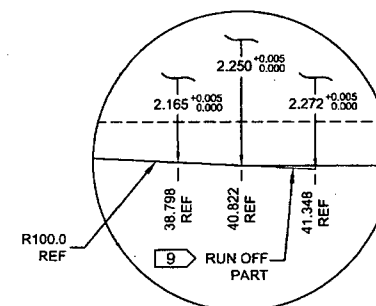
**TURNING DETAIL**



**DETAIL M:  
CUFF TRANSITION**  
B6-4  
NOT TO SCALE



**DETAIL L:  
CROSSTUBE CUFF**  
D7-4  
NOT TO SCALE



**DETAIL N:  
TAPER RUN-OFF**  
C3-4  
NOT TO SCALE

DEO ATTACHED

RELEASED

DESIGN	08	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	08	DRAWING NO.	REV. C
MFG. APPR.	08	D407-667-145	SHEET 4 OF 4
APPROVED	08	TITLE	SCALE
DE APPR.	08	CROSSTUBE ASS'Y (407 HIGH FWD)	NTS
DATE	08.11.06	<small>COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

NO. -667-145	TITLE CROSSTUBE ASS'Y (407 HIGH FWD)	REV. C	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-145-C-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN 97	CHECKED ASS	MFG. APPR. AB	APPROVED WD		DE APPR. H		
DATE 11.07.15	DATE 11.07.22	DATE 11.07.22	DATE 11/07/22		DATE 11.07.21		

**PURPOSE:**

REPLACE MAGNOBOND WITH PROSEAL.

**CHANGE:**

**IS:**

Item	Qty -145	Part Number	Description
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

**WAS:**

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	----------------	---

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

**IS:**

- 12) TO INSTALL D2891-1 SUPPORT: ABRAD MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

**WAS:**

- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

**RELEASED**  
2011-07-28  
WD

FILE		REV. C	<b>DART AEROSPACE LTD ENGINEERING ORDER</b>		D.E.O. NO. D407-667-145-C-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
CROSSTUBE ASS'Y (407 HIGH FWD)		AJS	CHECKED	MFG/ APPR. <i>E</i>	APPROVED <i>AP</i>	DE APPR. <i>AP</i>	
DATE	12.08.02	DATE	12.08.02	DATE	12.08.02	DATE	12.08.02

**PURPOSE:**

ADD ELECTRICAL GROUNDING STRAP

**CHANGE:**

ITEM	QTY	PART NUMBER	DESCRIPTION
1	X	D407-667-145	CROSSTUBE ASSEMBLY (407 HIGH FWD)
10	2	AN742D36	CLAMP
11	2	MS9165-05	ANGLE BRACKET
12	2	MS21042L3	NUT (OR MS21042-3)
13	2	MS27039-1-08	SCREW
14	4	NAS1149C0332R	WASHER (OR AN960C10L)

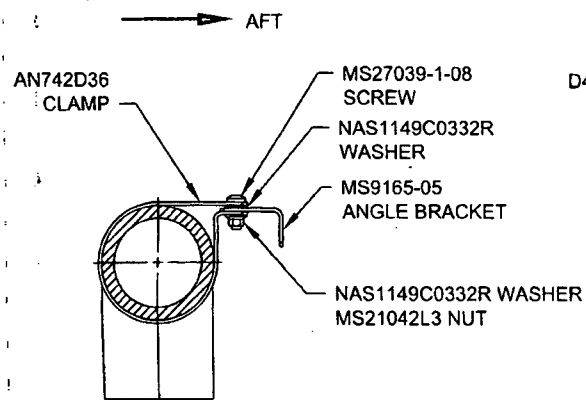
ADD

**GENERAL NOTES:**

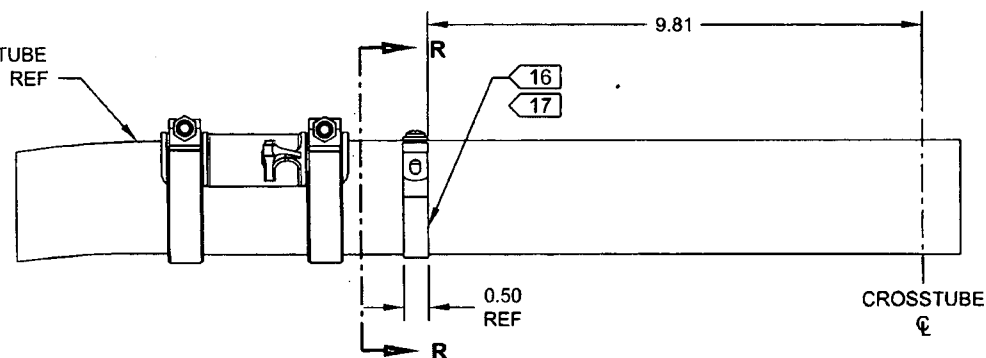
- 16) MASK AREA UNDER CLAMP PRIOR TO PAINTING
- 17) SEAL EDGES WHERE AN742D36 CLAMP MEETS WITH THE CROSSTUBE USING SIKAFLEX-241/-291 OR MIL-S-8802 CLASS B2 OR PROSEAL 890 SEALANT
- 18) PERFORM RESISTANCE CHECK TO ENSURE MAX RESISTANCE IS 10 MILLIOHMS

ADD

**RELEASED**  
CP 12.08.17  
ECN 12-631



**SECTION R-R**



**DETAIL P**  
BONDING STRAP INSTALLATION 2 PL

DRAWING NO.  
D407-667-1A

# DART SERVICE INSTRUCTION

TO AMEND INSTRUCTIONS FOR CONTINUOUS AIRWORTHINESS ICA-D206-667 Rev. 3 OR LATER

REF. CANADIAN STC: SH01-5

REF. FAA STC: SR01304NY

REF. EASA STC: EASA.IM.R.S.01179

## PURPOSE:

The supports on the following crosstubes are now installed using Proseal instead of Magnobond:

D206-667-101 @ CHG 004

D206-667-103 @ CHG 005

D206-667-107 @ CHG 002

D206-667-201 @ CHG 004

D206-667-203 @ CHG 004

D206-667-207 @ CHG 002

D407-667-105 @ CHG 004

## CHANGE:

For the crosstubes listed above, section 32.4 of ICA-D206-667 is amended as follows. Use Figures 32-4 to 32-8 of ICA-D206-667 for further reference. For crosstubes of an earlier change number, it is recommended that if the supports are removed, the supports should be reinstalled using the procedure listed below.

## 32.4 SUPPORT INSTALLATION





- 32.4.1 Locate the area on crosstube for installation of support (ref. Figures 32-4 to 32-8 of ICA-D206-667). For D206-667-101/-103/-107/-201 and D407-667-105 crosstubes, the outward face of the support tabs should be 13.08" (332mm) from the crosstube center. For D206-667-203/-207 crosstubes, the outward face of the support tabs should be 10.03" (255mm) from the crosstube center. Ensure paint finish of crosstube is intact; touch up as required per Chapter 5 (5.3.9) of ICA-D206-667.
- 32.4.2 If present, remove any paint/primer on bottom of supports. Abrade mating surfaces of support and crosstube with 400-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.
- 32.4.3 Ensure a layer of 3M Scotch-Weld 2216 B/A Epoxy Adhesive is on the bottom of the support. If required, either apply or touch-up support to have a 0.03" to 0.05" thick layer of adhesive over the entire mating surface. Allow supports to cure for 24 hours.
- 32.4.4 Abrade mating surfaces of support (after cure) and crosstube with 180-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.
- 32.4.5 Apply a 0.04" to 0.07" thick layer of Proseal 890 Class B or AMS-S-8802 Class B sealant underneath applicable support and install support.
- 32.4.6 Install the clamps opposite to crosstube support as shown in Figures 32-4 to 32-8 of ICA-D206-667. Install rubber cushions underneath each clamp around the bottom circumference of the crosstube up to the crosstube centerline. Torque clamps 80-100 in·lb (9.0-11.3 Nm). It is acceptable to use smaller or larger sized MS21920-XX clamps than those listed in ICA-D206-667, ensure that after torquing the clamps per this instruction, the nuts are in safety but not bottomed out.
- 32.4.7 Prior to installing crosstube on aircraft, allow supports to cure for 72 hours and recheck torque on clamps.

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01

APPROVED

BY:   
D. SHEPHERD (DE # 02)

DATE: 11.07.20  
CERT. NO.: SH01-5  
ISSUE NO.: 3

A	NEW ISSUE	CP	11.07.15
REV.	DESCRIPTION	BY	DATE
DESIGN		<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN			
CHECKED	ASS	DRAWING NO.	REV. A
MFG. APPR.	N/A	DSI 9565	SHEET 1 OF 1
APPROVED		TITLE	SCALE
DE APPR.		SUPPORT INSTALLATION CHANGE	NTS
DATE	11.07.15	COPYRIGHT © 2011 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



# DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS IIN-D206-667 REV. D AND EARLIER AND  
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA-D206-667 REV. 3 AND EARLIER

REF: CANADIAN STC: SH01-5

REF: FAA STC: SR01304NY

REF: EASA STC: EASA.IM.R.S.01179

## PURPOSE:

The purpose of this service instruction is to permanently add the D206-667-017 Kit to the DXXX-667-101/-103/-105/-107 Crosstube kits.

## INSTRUCTIONS:

DXXX-667-101/-103/-105/-107 Crosstubes at CHG 005/006/005/003 (respectively) and later are supplied with the D206-667-017 Grounding Strap Kit installed per section 3.2 of IIN-D206-667 Rev. D.

## WEIGHT AND BALANCE

There is a negligible weight change associated with the installation of this kit.

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01

APPROVED

BY:

D. SHEPHERD (DE # 02)

DATE: 12.08.02  
CERT. NO.: SH01-5  
ISSUE NO.: 3

A	NEW ISSUE (REF CIR 12-3)	AJS	11.08.02
REV.	DESCRIPTION	BY	DATE
DESIGN	AJS	<b>DART AEROSPACE LTD</b>	
DRAWN	AJS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>[Signature]</i>	DRAWING NO.	REV. A
MFG. APPR.	N/A	DSI 9628	SHEET 1 OF 1
APPROVED	<i>[Signature]</i>	TITLE	SCALE
DE APPR.	<i>[Signature]</i>	GROUNDING STRAP INSTALLATION	NTS
DATE	12.08.02	COPYRIGHT © 2012 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

## 407-667-105 Folio

### Setup

Use 1.6" spacers under 2.25 rollers

2.935" (2.875 + one .060 shim) for SA,, 2.995 ( 2.875 + two .060 )shims for SB Spacer in buggy on large table/adjust supporting rollers as required.

19.25", **36.4" RED** from cuff, centerline is @ 56.6

### LARGE TABLE

Run programs 407f 01-07 without stopping going down the taper, **36.4" line**, approaches are Y 3200 and W 1750. CHECK

Then run programs 407f 10-16 without stopping from **19.25" line**. "CHECK" approaches are Y 3500 and W 3200 for all programs running up taper, . Programs 17 and up are to finish tube off if necessary. CHECK between each program.. **Large table**

in order to reduce the height, increase cuff angle at program 7. tubes are still finishing too high. jw 11-08-26

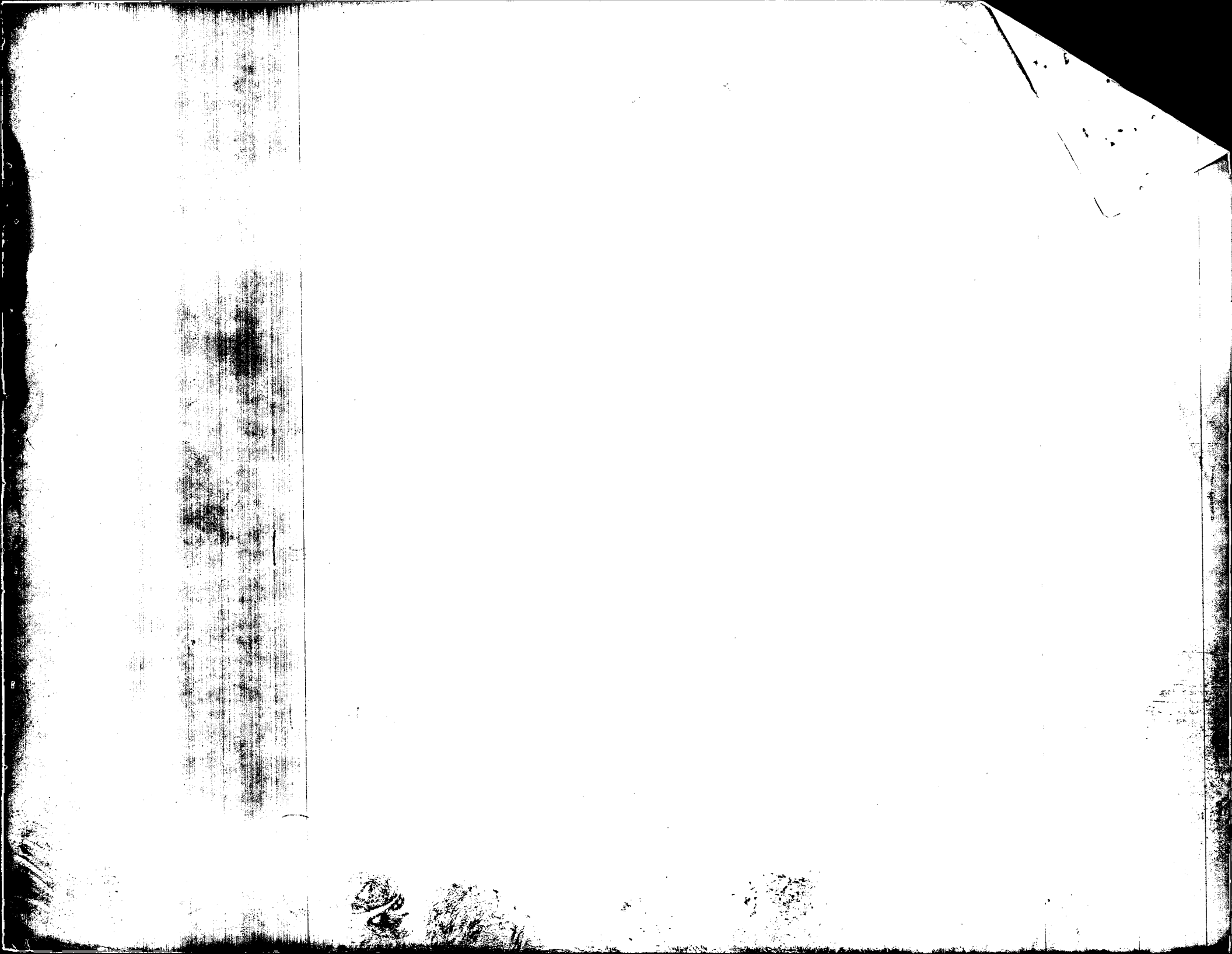
- update: increased power on step 9 of prog 7 by 20 points. tubes are finishing at prog 19. height fixed.

12-08-01 after program 7 on both tubes, side "B" had bent in substantially more than side "A". approximately 4" more than the first side. tubes both turned out okay, but were watched closely on the second side.

13-02-14 Bent 2 as per folio.. (1-7 CHECK.. 10-16 CHECK).. ran 17, 18, 19, 20... checking between each, 1st tube finished on 20, 2nd finished on 19..... (run 18a if really close to finished tangent line) MO

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16



**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

Page: 1 of 1

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO19565

Customer: Cash Sale

Dept: NDT YUL

Reference: 23883

Descr:

PN:

S/N:

Qty: 1

Make:

Model:

Reg:

A/C S/N:

TSN: 0

CSN: 0

TSO: 0

Sequence: 1

Task: UNSCHEDULED

Work Required:

CARRY OUT NDT ON FWD CROSS TUBES  
ITEM ID: D407-667-105

- ① WORK ORDER ID 114858
- ② WORK ORDER ID 114860
- ③ WORK ORDER ID 114859
- ④ WORK ORDER ID 114861

Action Taken:

LIQUID PENETRANT INSPECTION CARRIED  
OUT IAW ASTM E1417-M13 ON FOLLOWING ITEMS:

Date:

Initial/Stamp:

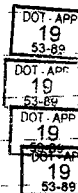
- ① WO 114858 =
- ② WO 114860 =
- ③ WO 114859 =
- ④ WO 114861 =

22 APR 14

22 APR 14

22 APR 14

22 APR 14



Description

Location P/N

Qty

Batch

S/N Off

S/N On

PENETRANT: ARDROX 970P25E  
BLACK LIGHT M 20189

TP010484

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:

Name:

GARY SMITH

ACA/SCA  
StampDOT APP  
19

Date:

22 APR

2014

